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AUTHOR Uthe, Elaine F.
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ABSTRACT

The effectiveness of a teacher-made slide-tape presentation for training experienced business teachers to teach the Intensive Office Program (IOP)--a high school course incorporating office practice, office machines, advanced typewriting and shorthand--was field tested. Three groups were involved: undergraduate non-business education students, undergraduate business education students, and graduate business education teachers enrolled in the 1976 summer course to become IOP teachers. All were given a 43-item true-false quiz and written guidelines for IOP, before and after viewing the presentation. Pretest-post test differences were significant for all three groups. Item analysis was made to identify test items needing revision. Those 15 concepts answered incorrectly by at least 20% on the post test were reviewed for slide and script clarity, as well as test item content. In conclusion, the present slide tape was found to be effective, but certain areas needed improvement. Additional development is recommended. (CP)

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ED155191

AUTHOR: Elaine F. Uthe
Head, Business Education
University of Kentucky

ASSESSING THE TEACHING EFFECTIVENESS OF AN AUDIO-VISUAL PROGRAM RELATING TO THE INTENSIVE OFFICE PROGRAM IN BUSINESS EDUCATION

Instructional materials should be field tested for effectiveness in teaching specific concepts before they are finalized and disseminated for wide-spread use. Teacher-made media programs (slides and tape recording), as one type of instructional material, may be developed to meet specific objectives such as teaching selected concepts; they should, however, be field tested to determine whether or not they meet the stated objectives. If they do not, the program should either be improved or discarded.

Background. The process of initiating innovative curriculum throughout an entire state requires careful planning and execution. The process includes specifying short-term and long-term goals, developing guidelines for initiation and operation of programs, providing formative and summative evaluation procedures, and executing the plan in the best manner possible.

In 1974 the Intensive Office Program approach was initiated for use in local high schools in Georgia; this two-hour advanced-level course in office occupations usually incorporates office practice, advanced typewriting, and office machines courses into a clerical program. It is also includes advanced shorthand, it is a secretarial program.

Because the Intensive Office Program was new in Georgia, a plan of action was needed: (1) publicize the concept, (2) select high schools and identify teachers who were willing to initiate the program, (3) provide training for the selected teachers, (4) assist teachers throughout the first year by enrollment in an internship, (5) assist with the development and/or selection of instructional equipment and materials, and (6) determine the success of the program.

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During the 1973-74 school year the teacher-educator* and the state supervisor** gave presentations at all state-wide business education meetings about the philosophy, objectives, and innovative instructional techniques involved in the Intensive Office Program approach as well as the procedures for gaining state approval of such a program in the local school. Then the local high schools and teachers were contacted and invited to participate in the project for the 1974-75 school year. These teachers were enrolled in a three-week summer workshop (University of Georgia and Georgia Southern College) and in a year-long internship (at the University of Georgia) during the 1974-75 school year.

The Problem

Because there is a need to provide consistently high-quality information at each professional meeting as well as in the summer workshops, a slide-tape program was developed to enhance the personal presentations. The media program explains the philosophy and objectives as well as the various simulation techniques utilized in the Intensive Office Program.

The Hypothesis

The IOP-related slide-tape program may be utilized for instruction as well as for promotion of the program. There is, however, a need to determine whether or not this particular media program is an effective teaching tool. Therefore, the hypothesis is that there is no difference in mean pretest and mean posttest scores obtained in connection with the viewing of the IOP-related slide-tape program with (a) undergraduate non-business education students, (b) undergraduate business education students, and (c) graduate business education teachers enrolled in the IOP course.

Also, each test item for which at least 20 percent of the responses were incorrect on the posttest would be considered decision points requiring revisions in either the test item, the tape recording, and/or the slides.

The Limitations

An assumption was made that the guidelines developed in 1974 were valid after review by teacher educators, state department personnel, and the Intensive Office Program interns.

In addition, an assumption was made that the teaching effectiveness of the IOP-related slide-tape program could be evaluated using a multiple-item True-False test.

Also, the slide-tape program was designed for use with experienced business teachers who would be familiar with the technical terms incorporated in it.

The Procedures

As stated previously, the Intensive Office Program was publicized through oral presentations by the teacher-educator and the state supervisor in Business Education at professional meetings throughout Georgia in 1973-74.

During the initial three-week summer course to prepare teachers to initiate and operate the Intensive Office Programs, some tentative guidelines were developed. These were reviewed by various business teacher educators, state department personnel, and selected business teachers. These guidelines were reviewed by the Intensive Office Program teachers after the one-year internship, by the business teacher educators, and by the state department personnel.

During the 1974-75 activities relating to the promotion of Intensive Office Programs throughout the state and in planning for additional summer courses, the need for a quality slide-tape program became apparent.

Production. A script explaining the philosophy, objectives, and simulation techniques unique to the Intensive Office Program was developed based on the 1974 guidelines and the introductory materials used in the teacher-preparation workshop. The script was reviewed by Intensive Office Program teachers and the state department personnel and was then recorded. Slides representing the concepts were taken during the teacher-educator's visits to the intern teacher in the local school; other slides were made from artwork.

A 43-item True-False test was developed based on the slide-tape program and the 1974 written guidelines.

Preliminary Field Test. The slide-tape program was first reviewed by those Intensive Office Program teachers from the 1974-75 and 1975-76 years for adherence to the specified concepts and objectives; the program was also reviewed by state department personnel and other business teacher educators.

Field Test. The actual field testing of the IOP-related slide-tape program used three groups:

(1) undergraduate non-business education students

(2) undergraduate business education students

(3) graduate business education teachers enrolled in the 1976 summer course to become Intensive Office Program teachers

In each case the students were given the 45-item True-False quiz as a pretest, viewed the slide-tape program, and then given the same quiz as a posttest. There was no discussion of the Intensive Office Program concepts before or during the pretest and viewing and no discussion until after the posttest had been completed. Students were asked to circle "1" or "2" to indicate the pretest and posttests, respectively.

The Results

Instructional materials that purport to teach specific concepts should enable the user to answer significantly more questions correctly on the posttest than on the pretest if the materials are indeed effective in teaching.

The hypothesis that there is no difference in the mean pretest and mean posttest scores of undergraduate non-business education students viewing the IOP-related slide-tape program was rejected. This group had a mean pretest score of 25.25 and a mean posttest score of 32.9, thereby improving 7.65 points. The t score of 9.48 for the pretest/posttest scores with 19 degrees of freedom was significantly different at the .01 level; therefore, the media program was effective in teaching the Intensive Office Program concepts (Table 1).

The second group of students, the undergraduate business education majors, had a mean pretest score of 26.4 and a mean posttest score of 31.4, thereby improving 5 points. The t score of 5.96, with 19 degrees of freedom, was significantly different at the .01 level; therefore, the null hypothesis of no difference was also rejected for this group (Table 2).

The third group, the graduate business education teachers, had a mean pretest score of 30.42 and a mean posttest score of 34.68, thereby improving 4.18 points. The t score of 6.0 with 18 degrees of freedom indicated that there was a significant difference in the pre- and posttest scores at the .01 level; therefore, the null hypothesis was also rejected for this group. (Table 3)

Therefore, the slide-tape program is effective in teaching the Intensive Office Program concepts to the three different groups.

Although no comparisons were made between groups of students, the graduate group had a higher mean pretest score than the undergraduate groups. The difference is probably due to the fact that the graduate business teachers enrolled in the summer course had already heard one or more of the presentations

at the professional meetings and/or had read one or more professional journal articles about this Intensive Office Program approach prior to enrollment.

Although this IOP-related slide-tape program may be used as it is, part of this study deals with identifying parts that need revision in order to increase the program's teaching effectiveness. Therefore, an analysis was made of the pattern of responses of each individual student from the pretest to the posttest using the following key:

R/R Right on both the pretest and the posttest

W/R Wrong on the pretest and right on the posttest

R/W Right on the pretest and wrong on the posttest

W/W Wrong on both the pretest and the posttest

Prior to giving the pretests and posttests, a decision was made to review those concepts on which at least 20 percent (or 12 students) answered incorrectly on the posttest. The concepts, identified as "items" on the test, need to be considered in three ways:

(a) Is the test item clear? valid?

(b) Does the slide adequately illustrate the concept?

(c) Is the concept clearly explained on the tape recording?

Of the 2,492 total responses to the 43 questions, 55.9 percent were right on both the pretest and posttest (Table 4); 22.5 percent were wrong on the pretest but right on the posttest--a worthwhile conversion; 6.9 percent were right on the pretest but wrong on the posttest--an unwelcome conversion; and 14.7 percent were wrong on both the pretest and the posttest.

The percentage of R/R (right on both tests) was relatively high and may be attributed to two causes: (1) students' prior knowledge, and (2) unknown amount of "guessing" on True-False test items.

The R/R figures provide little or no information for making revisions in the slide-tape program; however, those test items for which all responses were correct on the pretest may need to be examined to determine if they are well-written test items.

In the W/R category the conversion from pretest to posttest was 22.5 percent, a noticeable improvement in scores which may be attributable to the use of the slide-tape program. By examining the individual test items (Table 5), a series of effective portions of the IOP-related slide-tape program may be identified; these portions should not be changed when making revisions.

In the R/W category responses were stiched from right to wrong 6.9 percent of the time on the posttest, which indicates that some portions of the program may be providing misleading information or providing no information at all. These conversions should be studied test item by test item to determine need for revisions.

Furthermore, 14.7 percent of the responses were W/W--that is, wrong on both the pretest and posttest. These test items should be studied carefully as they indicate areas in which the slide-tape program and/or the test item itself was ineffective.

In applying the 20 percent cutoff point decision made prior to the pretest and posttest results, Items 4, 6, 10, 15, 16, 17, 24, 28, 29, 32, 35, 36, 37, 39, and 43 (a combination of Columns R/W and W/W under "Total Group" in Table 5) indicate areas in which revisions are needed.

SUMMARY AND CONCLUSIONS

The IOP-related slide-tape program was effective in teaching philosophy, objectives and knowledge of simulation techniques to the three groups of students who viewed the program as there was a statistically significant

difference between pretest and posttest scores for each group. However, an analysis of individual test items revealed that at least fifteen areas need revision; the revisions may involve the test item, slide, and/or script.

In conclusion, the present slide-tape program is effective but there may be areas in which improvements may be made. The revised media program, when completed, should be subjected to additional field testing to determine its teaching effectiveness.

Recommendations. The present IOP-related slide-tape program is designed for preparing experienced business teachers to initiate and operate an innovative program in a local school. A number of the intern teachers over the past two years have shown the media program to other groups--namely, school faculty and administrators who must approve all new programs, counselors who assist in guiding students into appropriate programs, and parents and businessmen's groups.

Also, during the past year several intern teachers have used this same media program to recruit students for next year's Intensive Office Program; one intern teacher, expecting an enrollment of 15, had 32 apply--another, expecting 18-20 enrollments, had 53 apply.

The use of the IOP-related slide-tape program for these two very diverse groups indicates a need for two additional programs--one geared for administrators and other faculty and one geared for student recruitment. Therefore, the present media program should be improved but consideration should be given at the same time to development of two additional versions to meet the needs of the various audiences.

TABLE 1

ANALYSIS OF PRETEST AND POSTTEST MEAN SCORES FOR NON-BUSINESS UNDERGRADUATE STUDENTS VIEWING SLIDE-TAPE PROGRAM ABOUT IOP

Student No.	Pretest Score	Posttest Score	Difference (D)	D^2
1	26	32	6	36
2	21	26	5	25
3	28	37	9	81
4	22	32	10	100
5	25	29	4	16
6	25	29	4	16
7	24	30	6	36
8	21	33	12	144
9	26	31	5	25
10	22	38	16	256
11	23	33	10	100
12	23	34	11	121
13	27	30	3	9
14	30	36	6	36
15	27	35	8	64
16	26	34	8	64
17	28	28	0	0
18	27	36	9	81
19	27	38	11	121
20	27	37	10	100
Totals	505	658	153	1431
Mean	25.25	32.9	7.65	
s.d.	2.49	3.44		3.61

Mean of the Differences: $\bar{D} = \frac{\Sigma D}{N} = \frac{153}{20} = 7.65$

Standard Deviation of the Differences:

$$s^2 = \frac{\Sigma D^2}{N} - \bar{D}^2 = \frac{1431}{20} - 58.5 = 71.55 - 58.5 = 13.05$$

$$s = \sqrt{13.05} = 3.61$$

Standard Error of the Differences:

$$s_{\bar{D}} = \frac{s}{\sqrt{N-1}} = \frac{3.61}{4.47} = .807$$

t-Test $\quad t = \frac{\bar{D}}{s_{\bar{D}}} = \frac{7.65}{.807} = 9.48 \qquad t = 9.48^{*}$ (.01 level)

TABLE 2

ANALYSIS OF PRETEST AND POSTTEST MEAN SCORES FOR UNDERGRADUATE BUSINESS EDUCATION STUDENTS VIEWING SLIDE-TAPE PROGRAM ABOUT IOP

Student No.	Pretest Score	Posttest Score	Difference (D)	D^2
1	32	33	1	1
2	22	30	8	64
3	28	33	5	25
4	21	29	8	64
5	30	35	5	25
6	28	38	10	100
7	27	40	13	169
8	33	30	-3	9
9	24	29	5	25
10	24	30	6	36
11	23	24	1	1
12	31	34	3	9
13	22	27	5	25
14	26	30	4	16
15	28	28	0	0
16	22	28	6	36
17	27	32	5	25
18	26	30	4	16
19	26	29	3	9
20	28	38	10	100
Total	528	627	99	755
Mean	26.4	31.4	4.95	
s.d.	3.4	3.94		3.64

Mean of the Differences: $\bar{D} = \frac{\Sigma D}{N} = \frac{99}{20} = 4.95$

Standard Deviation of the Differences:

$$s^2 = \frac{\Sigma D^2}{N} - \bar{D}^2 = \frac{755}{20} - (4.95)^2 = 37.75 - 24.5 = 13.25$$

$$s = \sqrt{13.25} = 3.64$$

Standard Error of the Differences:

$$s_{\bar{D}} = \frac{s}{\sqrt{N-1}} = \frac{3.64}{\sqrt{19}} = \frac{3.64}{4.36} = .83$$

t-Test $t = \frac{\bar{D}}{s_{\bar{D}}} = \frac{4.95}{.83} = 5.96^*$ (significant difference at the .01 level)

TABLE 3

ANALYSIS OF PRETEST AND POSTTEST MEAN SCORES FOR GRADUATE BUSINESSS EDUCATION STUDENTS VIEWING SLIDE-TAPE PROGRAM ABOUT IOP

Student No.	Pretest Score	Posttest Score	Difference (D)	D^2
1	39	42	3	9
2	32	36	4	16
3	35	37	2	4
4	31	35	4	16
5	26	27	1	1
6	28	40	12	144
7	36	38	2	4
8	28	28	0	0
9	35	37	2	4
10	31	33	2	4
11	29	35	6	36
12	30	35	5	25
13	27	35	8	64
14	28	39	11	121
15	34	37	3	9
16	28	30	2	4
17	25	30	5	25
18	25	30	5	25
19	31	35	4	16
Total	578	659	81	527
Mean	30.42	34.68	4.26	
s.d.	3.83	3.99		

Mean of the Differences: $\bar{D} = \frac{\Sigma D}{N} = \frac{81}{19} = 4.26$

Standard Deviation of the Differences:

$$s^2 = \frac{\Sigma D^2}{N} - \bar{D}^2 = \frac{527}{19} - 4.26^2 = 27.736 - 18.147 = 9.588$$

$$s = \sqrt{9.588} = 3.09$$

Standard Error of the Differences:

$$s_{\bar{D}} = \frac{s}{\sqrt{N-1}} = \frac{3.09}{4.359} = .708$$

t-test $t = \frac{\bar{D}}{s_{\bar{D}}} = \frac{4.25}{.708} = 6.0$ (Significant difference at .01 level)

TABLE 4

NUMBER AND TYPE OF RESPONSES FROM PRETEST TO POSTTEST FOR EACH GROUP AND THE TOTAL GROUP

Type of Group	Type of Response*			
	R/R	W/R	R/W	W/W
Undergraduate Non-Business Education Major	428	234	79	119
Undergraduate Business Education Major	545	236	76	130
Graduate Business Teacher	421	90	16	118
Total Responses	1,394	560	171	367
Percentage of Responses	55.9	22.5	6.9	14.7

TABLE 5

PRETEST AND POSTTEST RESPONSES BY GROUPS AND BY TOTAL GROUP

Key. R/R Right on both pretest and posttest
W/R Wrong on pretest and right on posttest
R/W Right on pretest and wrong on posttest
W/W Wrong on pretest and posttest

Ques.	Non-BE Undergrad.				BE Undergrad.				BE Graduates*				Total Group			
No.	R/R	W/R	R/W	W/W	R/R	W/R	R/W	W/W	R/R	W/R	R/W	W/W	R/R	W/R	R/W	W/W
1	4	8	4	4	18	2	3		15				37	10	7	4
2	17	1	1	1	22	1			14	1			53	3	1	1
3	15	5			17	5		1	15				47	10		1
4	6	5	3	6	11	3	3	6	3	2	1	9	20	10	7	21
5	5	12	1	2	12	8	1	2	7	5		3	24	25	2	7
6	8	3	5	4	14	4	5		14		1		36	7	11	4
7	10	9	1		16	5	1	1	14	1			40	15	2	1
8	17	3			20	3			15				52	6		
9	16	4			20	2	1		14	1			50	7	1	
10	2	2	3	13	3	3	7	10	9	1		5	14	6	10	28
11	9	8	2	1	21	2			13	1	1		43	11	3	1
12	16	2	2		17	3	3		12	2	1		45	7	6	
13	12	7	1		13	7	3		12	3			37	17	4	
14	20				19	3		1	15				54	3		1
15	1	3		16	1	8	1	13	1	2	1	11	3	13	2	40
16	6	6	3	5	6	4	3	10	1	7		7	13	17	6	22
17		10		10	1	10	1	11	2	7		6	3	27	1	27
18	10	7	2	1	14	6	2	1	13	1	1		37	14	5	2
19	15	2	3		22	1			15				52	3	3	
20	14	2	2	2	16	5	2		15				45	7	4	2
21	15	4	1		21	2			15				51	6	1	
22	9	7	3	1	15	4	2	2	14	1			38	12	5	3
23	15	2	3		19	3	1		15				49	5	4	
24	11	6	3		5	9	3	6	1	6	1	7	17	21	7	13
25	16	3	1		20	2	1		14	1			50	5	2	
26	12	6	1	1	18	4	1		13	1		1	43	11	2	2
27	8	10	1	1	4	14	3	2	2	8	1	4	14	32	5	7
28	6	7	6	1	5	5	5	8	5	2		8	16	14	11	17
29	1	6	4	9	2	7	1	13	6	2	1	6	9	15	6	28
30	1	16	1	2	1	18	1	3	3	9		3	5	43	2	8
31	13	4		3	16	5	1	1	14	1			43	10	1	4
32	5	2	4	9	5	7	6	5	1	2	1	11	11	11	11	25
33	16	3	1		21	2			15				52	5	1	
34	19	1			18	5			14	1			51	7		
35	6	3	3	8	4	9	1	9	5	1	2	7	15	13	6	24
36	6	7	2	5	7	4	4	8	8	2		5	21	13	6	18
37	2	9	3	6	2	12	3	6	2	2	2	9	6	23	8	21
38	14	2	2	2	21	1	1		14	1			49	4	3	2
39	9	6	3	2	12	4	3	4	5	3	2	5	26	13	8	11
40	16	3	1		16	6		1	12	3			44	12	1	1
41	6	12		2	10	11	1	1	12	3			28	26	1	3
42	8	9	2	1	10	9	1	3	6	5		4	24	23	3	8
43	11	7	1	1	10	8	1	4	6	3	1	5	27	18	3	10